

# Familial frequency of vitiligo and its association with autoimmune disorders

Ghazala Butt, Faria Altaf, Uzair Wazir, Sabrina Suhail Pal

Department of Dermatology Unit II, King Edward Medical University, Mayo Hospital, Lahore

**Abstract** *Objective* To determine the familial frequency of vitiligo and its association with autoimmune disorders.

*Methods* This cross-sectional study was conducted in the Department of Dermatology, Mayo Hospital, Lahore. Hundred patients of vitiligo of any age and either sex, diagnosed on the basis of history and clinical examination were enrolled from the outpatient department. Patients were evaluated for familial frequency of vitiligo and its association with other autoimmune diseases by means of a specially designed proforma.

*Results* Total number of vitiligo patients was 100. Family history of vitiligo was seen in 22% of cases. Associated autoimmune disorders were seen in 23% of cases and were mainly diabetes mellitus, autoimmune thyroid disease, alopecia areata and eczemas.

*Conclusion* This study reveals that generalized vitiligo is associated with other autoimmune disorders, showing similar genetic basis. Therefore it is important to evaluate as well as investigate, where necessary, vitiligo patients for other autoimmune disorders.

**Key words**

Vitiligo, familial frequency, autoimmune disorders.

## Introduction

Vitiligo is an acquired pigmentary disorder of the skin and mucous membranes characterized by selective destruction and / or inactivation of melanocytes resulting in macules and patches of depigmentation.<sup>1</sup>

The exact etiology of vitiligo remains obscure but research suggests that it may arise from autoimmune, genetic, oxidative stress, neural or viral causes.<sup>2</sup> The autoimmune etiology is most widely accepted as there are variable autoimmune diseases which are associated with vitiligo. Other important argument in support of this theory is the presence of circulating autoimmune antibodies against the

specific melanocyte cell surface antigens in the serum of vitiligo patients.<sup>3</sup>

Studies have shown increased frequency of vitiligo in first degree relatives of the patients with vitiligo.<sup>4</sup> Generalized vitiligo is the most common de-pigmenting disorder, with a frequency of approximately 0.4% in most populations around the world.<sup>5</sup> The family members of vitiligo patients from the Caucasian population are predisposed to vitiligo and other autoimmune diseases, including autoimmune thyroid disease, pernicious anemia, SLE, Addison's disease and inflammatory bowel disease. The autoimmune thyroid disease is the most prevalent autoimmune disease among the patients with generalized vitiligo, with the highest overall frequency of 19.4% among the Caucasian patients,<sup>4</sup> followed by 7.4% in Japanese population.<sup>1</sup>

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**Address for correspondence**

Dr. Ghazala Butt,  
Department of Dermatology,  
King Edward Medical University,  
Mayo Hospital, Lahore  
Email: ghazalakashmiri@gmail.com

Studies of vitiligo and its association with other autoimmune diseases from various populations of the world show different results. There is no such study done till now in Pakistan. The purpose of our study was to focus on the familial frequency of vitiligo and the occurrence of concomitant autoimmune disorders in Pakistani patients.

## Methods

One hundred patients of vitiligo were enrolled randomly from the outpatient dermatology department, Mayo Hospital, Lahore. Informed, as well as written consent was obtained. Vitiligo was diagnosed on the basis of history and clinical examination. Subjects were questioned about the age at onset, the duration of the disease, family history of vitiligo, and history of autoimmune thyroid disease, diabetes mellitus, rheumatoid arthritis, psoriasis, SLE, alopecia areata, Addison's disease and other autoimmune diseases. Serum T3, T4, TSH, fasting blood sugar and 2 hour postprandial were performed in every patient and anti-dsDNA antibodies, as well as, RA factor were sent to laboratory if required after clinical evaluation. All this information was recorded on specialized designed proforma.

## Results

54 males and 46 females were enrolled and completed the study. Demographics are summarized in **Table 1**. Twenty two patients (22%) reported positive family history of vitiligo in father, mother, first-degree relatives or second-degree relatives (**Table 2**).

Twenty three patients (23%) were diagnosed having other autoimmune disorders, diabetes mellitus was found in eight (8%) patients while autoimmune thyroid disease was seen in five (5%) cases, eczema in four (4%) and alopecia areata in three (3%) patients. Urticaria and psoriasis were less frequently seen in two (2%) and one (1%) patients, respectively (**Table 3**).

**Table 1** Demographics of 100 patients with vitiligo.

| Age (years) | No. of patients | Age of onset of vitiligo |
|-------------|-----------------|--------------------------|
| < 20        | 25              | 40                       |
| 21-40       | 60              | 48                       |
| 41-60       | 15              | 12                       |

**Table 2** Frequency of positive family history in vitiligo patients (n=22) frequency

| Family member with history of vitiligo | N (%)     |
|--|-----------|
| Father                                 | 5 (22.7%) |
| Mother                                 | 7 (31.8%) |
| First-degree relative                  | 8 (36.4%) |
| Second-degree relative                 | 2 (9.1%)  |

**Table 3** Associated autoimmune diseases in patients with vitiligo.

|                            | Number of patients |      |        |
|----------------------------|--------------------|------|--------|
|                            | Total              | Male | Female |
| Diabetes mellitus          | 8                  | 4    | 4      |
| Autoimmune thyroid disease | 5                  | 2    | 3      |
| Eczema                     | 4                  | 3    | 1      |
| Alopecia areata            | 3                  | 0    | 3      |
| Urticaria                  | 2                  | 1    | 1      |
| Psoriasis                  | 1                  | 1    | 0      |

There was no gender difference in the incidence of associated diseases.

## Discussion

Vitiligo is a multifactorial disease. There are many causes but autoimmune etiology is most important in the pathogenesis of vitiligo. The autoimmune hypothesis is supported by the family history of vitiligo, association with other autoimmune disorders, presence of autoantibodies to melanocytes and positive response to immunosuppressive therapeutic agents.<sup>6</sup>

Vitiligo is associated with autoimmune thyroiditis, Grave's disease,<sup>5,7</sup> autoimmune polyendocrinopathy,<sup>8</sup> Addison's disease,<sup>9</sup> pernicious anaemia,<sup>3,4</sup> myasthenia gravis, alopecia areata, diabetes mellitus, rheumatoid arthritis, systemic lupus erythematosus,<sup>3</sup> pemphigus vulgaris and foliaceus,<sup>10,11</sup> morphea<sup>12</sup> and discoid lupus erythematosus.<sup>13</sup>

In our study, 22% of patients showed positive family history of vitiligo. This is in comparison with Shajil *et al.*<sup>14</sup> who found positive family history of vitiligo in 21.93% of patients. Tanioka *et al.*<sup>1</sup> noted positive family history in 26% of patients, which also support our results. Another Indian study<sup>15</sup> reported 36% of patients with family history of vitiligo. All these studies establish the genetic basis of vitiligo.

We observed that 23% of our patients had at least one additional autoimmune disease associated with vitiligo. Narita *et al.*<sup>16</sup> reported similar results, i.e. 20.3% in Japanese population. A large population-based study from Saudi Arabia<sup>17</sup> found associated autoimmune diseases in 9.5% patients, which is in contrast to our study. Similarly, Poojary *et al.*<sup>18</sup> had observed association of autoimmune diseases only in 2.94% cases. Both these studies are in contrast to our findings. The reason seems to be the retrospective nature of these studies. The results were compiled by using a retrospective questionnaire based on the history and medical records of patients. If these studies had been prospective ones and few basic investigations for other autoimmune disorders included then results might have been different. Although less frequently associated in few studies but these findings show that vitiligo and other autoimmune disease may have a common genetic etiology.

In various studies, autoimmune thyroid disease has been reported to be most prevalent among the autoimmune diseases. Tanioka *et al.*<sup>1</sup> and Belterle *et al.*<sup>19</sup> reported 7.4% and 7.5% associated thyroid dysfunction respectively. We observed autoimmune thyroid disease in 5% vitiligo patients in our study. In contrast, in our study diabetes was the most common disease. Diabetes mellitus was associated in 8% cases in our study. This is supported by a study performed in Karachi,<sup>20</sup> which reported association of vitiligo and diabetes in 10% cases. It shows that diabetes is more frequently

associated with vitiligo in Pakistani population. The reason may be that diabetes is more common as compared to thyroid dysfunction in this part of the world.

Among the cutaneous autoimmune diseases alopecia areata was found in 3% of cases in our study. An Indian study<sup>21</sup> performed in Ludhiana, reported association of vitiligo with alopecia areata in 2.8% of patients, which is comparable with our results. Another study performed by Gopal *et al.*<sup>15</sup> reported that 7.4% vitiligo patients had an association with alopecia areata, which is in contrast to our study. This may be due to larger number of patients (150) in the latter study.

## Conclusion

Autoimmune diseases are associated with significant number of vitiligo patients in our population. It is important to evaluate patients of vitiligo thoroughly for an association with other autoimmune diseases.

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